

C-A OPERATIONS PROCEDURES MANUAL

3.0 Local Emergency Plan for the Collider-Accelerator Complex

1. Purpose

The Local Emergency Plan for the Collider-Accelerator Complex is intended to provide general guidance for responding to most incidents which may occur at the Complex. The Local Emergency Plan supplements the Laboratory Emergency Plan and takes into account the special conditions which exist in some facilities. In addition, the Local Emergency Plan describes Laboratory-wide emergency signals and the reactions required by Collider-Accelerator personnel. The various activities are dispersed over large areas of the BNL site. Therefore, Local Emergency Coordinators are named for each building of the Complex, and several assembly areas are named instead of one centralized location.

1.1 Description of Facility

The Collider-Accelerator Department is responsible for a complex set of accelerators and beam transfer equipment. Heavy ions from the Tandem Van de Graaff, or protons from the Linear Accelerator (LINAC), inject into the BLIP Facility and AGS Booster, then into the AGS Ring. After that, they are transported to the RHIC tunnel where they will be injected into the collider rings to create two counter-rotating beams.

Building 930 has a prototype electron beam injection system to conduct studies for a potential future injector system for the Collider.

The AGS also operates an experimental program with fixed primary targets located in the Slow Extracted Beam (SEB) area in Building 912, or the Fast Extracted Beam (FEB), for the AGS to RHIC Transfer line (AtR), g-2 experiment, and U-line.

The Booster sends beam to the Booster Applications Facility, (BAF) Buildings 956, 957 and 958, where cells, animals, etc. are irradiated for radiobiology.

Building 939 has a prototype for a future collider electron cooler.

Building 945 has a small Tandem Van deGraff for studying its effectiveness for explosives detection.

The Collider Center is located at the 5 o'clock position (north = 12 o'clock), and the experimental halls and support equipment are located at the 2, 4, 6, 8, 10, and 12 o'clock positions.

The potential for an emergency is considerably higher during operational periods due to the presence of cryogens, flammable gases, pressurized vessels, extensive electrical power, radiation hazards, etc. However, some hazards remain present during non-operational periods; therefore, this Plan is in effect at all times.

1.2 Hazards

Specific incidents for which implementation of this Plan might be required are:

1.2.1 Facility

- Fires
- Explosions
- Industrial accidents
- Personnel injury
- Oxygen deficiency
- Uncontrolled release of radioactive, hazardous or toxic material
- Excessive radiation exposure
- Oil/chemical or other hazardous material spills
- Release of explosive or flammable liquid or gas
- Electrical fault
- Actual or threatened rupture of a pressurized vessel
- Others; as determined by local emergency responders

1.2.2 Natural Phenomena

- Earthquake
- Hurricane, tornado or other wind storm
- Snow or ice storm

1.2.3 Terrorist Threats or Acts

- Conventional Bomb Threat
- Overt or covert action, including sabotage
- Security breach of temporary classified areas (proton radiography)

2. Authority and Responsibilities

2.1 Introduction

Certain unplanned events can occur that can range from minor (handled locally by C-A staff), to large (requiring non C-A staff assistance). For the purposes of emergency planning, these events are divided into two broad categories, Occurrences and Operational Emergencies.

Occurrences are either “off-normal” or “unusual”, and C-A-OPM, Section 10 covers the requests for Occurrence Reporting.

Operational Emergencies are more serious, unplanned, significant events, or conditions that require time-urgent response from outside the immediate facility or area of the incident. No emergencies from C-A facilities have the potential to affect the off-site public health and safety.

If an Operational Emergency does not involve a significant release/loss of control of a hazardous or radiological material, it is classified solely as an Operational emergency (OE). If it does involve a significant release/loss of control of hazardous or radiological material, it is further classified as either an Alert or Site Area Emergency depending on the severity. In addition, Site Area Emergencies may also meet the OSHA criteria for releases requiring emergency response. These events are referred to in the plan as “OSHA Events”. As described below, an Alert, Site Area Emergency or an OSHA Event require assistance of non-C-A staff, and activation of the BNL Emergency Response Organization.

2.1.1 Alert

An event in progress, or having occurred, which involves an actual or potential substantial reduction of the level of control over hazardous materials, that may require on-site protective actions for the safety of personnel or the environment.

The purpose of an Alert is to: activate BNL emergency facilities; mobilize BNL personnel; provide continuous assessment of pertinent information for DOE decision makers, offsite authorities, the public, and other appropriate entities; conduct appropriate assessments, investigations, or preliminary/confirmatory sampling and monitoring; mitigate the severity of the occurrence or its consequences; and prepare for other response actions should the situation become more serious.

2.1.2 Site Area Emergency

An event in progress, or having occurred, which involves actual or likely major failures of facility functions which are needed for the protection of on-site personnel, the public health and safety and the environment.

The purpose of the Site Area Emergency is to: provide continuous assessment of pertinent information for DOE decision makers, off-site authorities, and other appropriate entities; establish communications,

consultation, and liaison with off-site authorities; provide information to the public through offsite authorities and the media; conduct or assist in any evacuations and sheltering (not anticipated as a required action for C-A emergencies); conduct appropriate assessments, investigations, or sampling and monitoring; mitigate the severity of the actual or potential consequences; and mobilize appropriate emergency response groups or security forces for immediate dispatch should the situation become more serious.

2.1.3 OSHA Events

Site Area Emergencies, which involve uncontrolled releases of hazardous substances, which require immediate response to prevent death or serious injury to BNL employees, visitors, and/or guests, are also referred to as OSHA Events.

OSHA Events are covered by 1910.120(q), which establishes a set of requirements for the staff providing response to the spill scene. This includes the Fire/Rescue Group and BNL safety and facility personnel responding to assist them.

2.2 Laboratory Emergency Supervisor (LES)

The BNL Emergency Plan designates a Laboratory Emergency Supervisor (LES) who would be called for events which could have lab-wide or multi-facility impact. In the absence of the primary LES, the line of succession will be in accordance with the Laboratory Emergency Notification Book.

Upon activation of the Laboratory Emergency Plan, the LES shall be the BNL manager responsible for overall direction of response to the emergency. Decisions made by the LES shall be based upon information and advice provided by the Incident Commander (IC), Departmental Emergency Coordinator (DEC), the Local Emergency Coordinator (LEC), and other knowledgeable persons present at the scene.

2.3 Incident Commander

For most incidents at the Collider-Accelerator Complex, the LES will not be required, and the Incident Commander (IC) shall be the Fire/Rescue Captain. The Incident Commander has the overall command and control of emergency response. The IC, together with the DEC and LEC, shall select a staging area for emergency response called the Command Post. The DEC and the LEC report to the IC and advise on local hazards.

2.4 Department Emergency Coordinator (DEC)

The DEC is responsible for directing C-A departmental emergency operations and accident assessment. The DEC succession list is assigned according to the table below:

Status	DEC
Operations Coordinator on shift	1. MCR Operations Coordinator 2. Building Local Emergency Coordinator/CAS Watch 3. ESH Coordinator
No Operations Coordinator on Shift	1. Building Local Emergency Coordinator/CAS Watch 2. ESH Coordinator 3. ESHQ Division Head

2.5 Local Emergency Coordinator (LEC)

Due to the expanse of the Collider-Accelerator complex, Local Emergency Coordinators are also assigned to provide expertise in the immediate local area of the incident. The LEC is charged with the responsibility of protecting all personnel, facilities, and equipment, in the area for which they are designated, and, when possible, for accounting for all personnel in the area at the time of the incident. The LEC is also responsible for training new employees in the local hazards and emergency response actions. See [C-A OPM 3.2](#) and SBMS Subject Area ([Emergency Procedures](#)) for specific LEC duties and procedures.

2.5.1 In the event the primary LEC is not available, the Collider-Accelerator Support (CAS) Coordinator shall act as LEC. If the primary LEC arrives, they shall take over for the CAS.

2.5.2 When the Tandem van de Graaff (TVDG) is operating, the operator-in-charge (OIC) shall act as LEC for Building 901A.

2.6 Radiological Control Technician (RCT)

Upon notification by the DEC or LEC, the on-duty RCT shall report to the Command Post and wait for further instructions. The on-duty RCT is responsible for advising the DEC and LEC of the radiological conditions in the affected area, and assisting emergency response personnel in controlling their radiation dose to the limits specified in the BNL RadCon Manual. [C-A-OPM 3.4](#) documents the specific duties and procedures for on-duty RCT. In the event the DEC or RCT is not on shift and their expertise is required, the Incident Commander can request appropriate personnel to be called in.

2.7 Cryogenic Watch

During an incident involving the RHIC tunnel or g-2 Cryogenic System, the Cryogenic Watch (CW) is responsible for putting the cryogenic equipment in a safe condition according to procedures.

For AGS experimental areas in Building 912, the Cryogenic Target Watch (CTW) will respond to the incident scene for all situations involving cryogenic targets. For all situations involving liquid hydrogen or flammable gas, the CTW shall do the following:

2.7.1 Liquid Hydrogen/Flammable Gas Emergency

Upon notification of an alarm involving a liquid hydrogen target, the CTW will respond to investigate the situation. If the alarm is diagnosed to be caused by a hazardous condition, the CTW is responsible for initiating the building evacuation signal, and keeping the DEC informed of the equipment status. The CTW should remain at the incident scene as long as he/she is not in any danger. If the hazard elevates, or has a potential to elevate to imminent danger, the CTW shall report to the Command Post. [C-A-OPM 8.11.4](#) documents additional procedures for a liquid hydrogen emergency. The Hold Point for Building 912 is North of Building 940 (Section 5.4.1).

2.8 Main Control Room (MCR) Operators and Operations Coordinators

The Main Control Room shall be the center for communications in the event of an incident during operations. The MCR Operators and Operations Coordinators may be required to assume the roles of DEC or LEC depending on the circumstances. [C-A-OPM 3.5](#) documents the specific MCR Operator duties and procedures.

Operators need not look up the emergency procedures when taking immediate actions in emergency situations, but procedures shall be reviewed immediately after to validate the action.

2.9 Experimenters

In the event of an incident in an experimental area, the Senior Experimenter or Shift Leader, shall assist the LEC. Each experimental area is responsible for having specific procedures for emergency situations.

2.10 All personnel are responsible for following the requirements from [SBMS – Emergency Preparedness](#).

3. Prerequisites

None

4. Precautions

The safety of personnel is of primary importance. Care should be taken not to give instructions to personnel, which might place them in the way of physical harm.

5. Procedures

5.1 Notifications

5.1.1 Main Control Room Notifications - Operating periods

During operating periods the Main Control Room (MCR) may be notified of an incident or emergency in several ways. Fire alarms and their locations show up directly on a screen in the MCR. Information on spills, or other incidents that are reported via ext. 2222 or 911, will be forwarded to the MCR by the administrative staff. The MCR may also be called on the telephone directly from the incident scene or through the portable radios.

5.1.2 Emergency Call-Down List

During C-A Complex operating periods, BNL Security shall call the MCR if on shift. If only Cryo Control Room is on shift, security shall call the Cryo Control Room (ext. 3837) when informed of an incident. During shutdowns, security personnel shall implement the emergency call-down list, as shown in Attachment 3.0.a. The individuals on the emergency call-down list have been selected as those persons having a general knowledge of the organization and activities in their areas. They will, in turn, inform the DEC of the incident, and contact appropriate administrative personnel regarding serious injuries or incidents. They may also contact various group leaders or individuals regarding emergencies involving specific areas, apparatus or personnel.

5.1.3 Special Hazards During Shutdowns

Since special hazards do not always exist in the experimental areas during shutdown, the ESH Coordinator, or designee, shall notify the Police and Fire/Rescue Groups in writing if special hazards exist during extended shutdowns.

5.2 Emergency Signals

Abbreviated emergency plans are posted at each C-A building, listing the assembly and shelter areas, evacuation zone, and Local Emergency Coordinator.

5.2.1 Laboratory Emergency Signals

5.2.1.1 Plectrons

Radio controlled Plectrons (electronic alerting devices) are strategically located throughout the Complex, and also sitewide. They can be activated regionally or sitewide to deliver warnings or evacuation messages, or to notify the Department of an emergency. The Plectrons in the Complex will be brought to the Assembly Areas when these locations are activated. Plectron locations are listed in [C-A-OPM-ATT 3.0.a](#). Plectrons are tested each Monday at noon.

5.2.1.2 Alert Site Signal

The site warning signal is the continuous sounding of the site sirens for five minutes. Upon hearing this signal, all personnel, except those having emergency response assignments, shall proceed to the Indoor Assembly Areas and await further instructions.

Individuals who may be in the RHIC tunnel upon activation of a Laboratory Emergency Signal may not hear the sounding of the site sirens. To compensate, the fire alarm in the tunnel is to be activated at the same time the site sirens are sounded, thereby notifying individuals. After exiting the tunnel, site warning and/or evacuation signals will then be heard. Upon hearing the above-mentioned signals, personnel will then report to their designated assembly areas. Personnel will be trained with regard to the various methods of notification.

Means of activation of the fire alarm for this purpose is provided in Bldg 1005S assembly area and in the Main Control Room. The DEC, or designee, is responsible for ensuring this alarm is activated.

5.2.1.3 Site Evacuation

Site evacuation normally occurs through announcements on the Plectrons after the alert site signal has sounded. The evacuation zone is listed on the side of the Plectron. A map of the site with evacuation zones is also shown in the back of the BNL phone book.

The site evacuation signal is the intermittent sounding of site sirens for a period of five minutes. Upon hearing this signal, all personnel, except those having a site wide emergency response function, shall leave the Laboratory in accordance with the directions given via the Plectrons. Follow the order of any BNL Police Officers as you evacuate.

5.2.1.4 Sheltering-in-Place

Announcements may be made over the Plectrons recommending sheltering-in-place due to the nature of the emergency. The shelter locations are listed on the Abbreviated Emergency Plans posted at each building. Plectrons will be brought to the shelter locations.

5.2.2 Fire Alarms

If a building fire alarm bell is heard at any location in the Complex, all personnel shall evacuate the affected building and assemble at the Outside Assembly Area.

A fire may be reported by either pulling a manual fire alarm box or by calling the emergency number, ext. 2222 or 911. Either action will result in the response of the Fire/Rescue Group. However, pulling the manual fire alarm box first, followed by a phone call to ext. 2222 or 911, is the preferred notification method, since this will also result in the alarm location being displayed in the Fire Station and activate the local fire alarm bells.

Fire alarms may also be activated by automatic detection devices located in most buildings.

5.2.3 Medical or Other Non-Fire Emergency

Medical, rescue, or other emergency aid, can also be summoned by phoning ext. 2222 or 911, or pulling a fire alarm manual box (followed by

a phone call). A phone call is the preferred means because Fire/Rescue does not normally report to alarms with the ambulance, and specific information regarding the nature of the emergency can be provided. Experimenters are trained to pull the fire alarm box followed by a phone call, because this will immediately signal where the problem is located.

5.2.4 Building 912 Evacuation Alarm

The Building 912 Evacuate signal is a wavering klaxon accompanied by the intermittent sounding of fire alarm bells in the experimental areas. During AGS operations, the evacuation alarms may be activated via an “Evacuate” button installed in the MCR, The Target Desk, or at each hazardous device, e.g. liquid hydrogen targets, and large explosive gas detectors. During periods when liquid hydrogen, explosive gases, or other hazardous devices are not in use, the evacuate alarm can be initiated locally or from the MCR and Target Desk.

Following the initiation of an evacuation alarm, the actions which follow are:

- A. A public address announcement will be made on the emergency microphone in the MCR to advise personnel to stay clear of the evacuation areas.
- B. The Fire/Rescue Group receives an automatic signal that Building 912 is being evacuated.
- C. Flashing signs located outside of all experimental building entrances stating:

Stay Clear Extreme Emergency Building Evacuated

will be lit and the internal exit signs over the doors will be illuminated with flashing lights.

- D. Indicating lights and/or alarms will annunciate in the MCR.

5.3 Communications

5.3.1 Public Address System

Some of the Collider-Accelerator buildings can be reached by the public address (PA) system. In the C-A buildings, the PA system can be accessed at the MCR, Target Desk, Hold Point, C-A administrative offices, and at most experimental area interphone locations.

5.3.2 Radio Communications

Communications between operations personnel can be accomplished by radio. The portable radios are capable of being patched to the Security frequency and the Fire/Rescue frequency. Once the "patch" is requested by the DEC to the Security watch desk, the three groups are able to communicate with each other.

Security, Fire/Rescue, and Collider-Accelerator LEC and DEC, shall unanimously decide when to terminate the "patch".

5.3.3 Commercial Telephone Service

Commercial telephone service is available throughout the Complex and the Laboratory. The telephone number to report an emergency to Security and Fire/Rescue is ext. 2222 or 911. The Main Control Room phone number is ext. 4662.

The Police Captain and Fire/Rescue Captain vehicles each carry a mobile telephone, which can be made available for use by the DEC or others when necessary. To phone a BNL extension, the seven-digit number must be called (344-XXXX).

5.3.4 Pager System - For Individual Notification

Two types of pagers are available through the BNL commercial telephone system. To access the system, dial 3456, wait for the tone, AND dial the pager access number. For voice pagers (first number 0-3), speak your message after the tone. The message should be given at least twice. For digital pagers (first number 4-9), enter your callback number after the tone (up to 10 digits).

5.4 Hold Points

Hold Points are designated locations that responding BNL emergency forces will report to, and not proceed beyond, without MCR approval due to special hazards (high radiation, explosive gases, etc.). The DEC, LEC, or ES&H Coordinator is responsible for notifying the Fire/Rescue Group that the Hold Point is in effect.

5.4.1 Building 912

The Hold Point is located on the West side of Thomson Road, just South of Henry Street, where the Fire/Rescue forces pause until they receive clearance from the MCR to proceed into the emergency area. This Hold Point is valid only for fire alarms/incidents originating from Building 912.

During an evacuation emergency of Building 912, the Hold Point may become the Command Post. The equipment available at the Building 912 Hold Point is:

- Communication: Telephone extensions 4807 and 2024. A portable radio will be taken to the Hold Point by the reporting Operator.
- Evacuate button
- PA capable of paging all AGS

When the Fire/Rescue group receives clearance from MCR, or when the Hold Point is not in effect, they will respond directly to the roll-up door number closest to the incident scene.

5.4.2 There is no need for any Hold Points for RHIC at this time. If a special condition exists, the ES&H Coordinator shall designate a Hold Point and notify the Police and Fire/Rescue Groups in writing of the special hazard.

5.5 Command Post

The Command Post shall be a safe location near the incident scene for the assembly of responding local emergency forces, advisory personnel, hazardous equipment operators, etc. The Command Post shall be designated by the Incident Commander in conjunction with the DEC or LEC, and shall be an area not likely to be directly affected by the incident.

The Fire/Rescue Command car may be used as the Command Post. The Command Car is equipped with radios, telephones, building maps, and other emergency equipment.

5.6 Assembly Areas

Indoor and outdoor assembly areas are listed on signs posted in all buildings on site. Indoor assembly areas are used for site-wide emergencies, and outdoor assembly areas are used if there is any local fire alarm from the building.

5.7 Personnel Accountability

When at the Assembly Areas, all supervisors shall account, as best as possible, for the personnel in their groups. The evacuated area should be checked to ensure that all personnel have responded to the evacuation signals. Certain normally unoccupied areas, or areas where the fire alarms or PA system may not be heard, require building sweeps to ensure total evacuation. A list of these areas and the number of personnel recommended for performing the sweep are listed in [Attachment 3.0.a](#). Assignment of personnel to perform the building sweep shall be made by the LEC in charge of the area.

5.8 Radiological Concerns

Any emergency that will require a person to receive a radiation dose exceeding the Department Administrative Dose Limits, will require the approval of the C-A Department Chair, or designee, Laboratory Emergency Supervisor (LES), or the Incident Commander.

5.9 Re-Entry

When the LES or IC determine that the incident/emergency no longer poses a threat to life or property, the IC shall declare the emergency terminated. At this time the emergency forces may withdraw and evacuated personnel shall be allowed to return into the area.

5.10 Emergency Equipment

5.10.1 Spill Response

All personnel witnessing a spill shall report the incident in accordance with the [SBMS Subject Area – Spill Response](#)

Spill control supplies are available in certain Buildings where hazardous liquids exist. These supplies include drain covers and absorbent "pillows" and mats. Some Collider-Accelerator vans or trucks have limited control supplies. They can be used to contain a spill and mitigate the effect on the environment until the Fire/Rescue Group responds. Spill response should only be done if the containment action can be accomplished without endangering personnel.

5.10.2 Fire Extinguishers

Fire extinguishers are located throughout the Complex.

5.10.3 When hydrogen targets are present, hydrogen detectors are located on the AGS experimental floor in tents above targets and the dewar enclosures. These alarms are remoted to the MCR.

Status boards are maintained by the CAS Group in Building 940. These boards show any gas vessels, such as dewars, targets, Cerenkov counters, etc., which could constitute an explosive hazard in the event of a fire.

5.11 Training

This Plan depends upon proper orientation, training programs, and drills for the staff. This applies particularly to those people who may be called upon to accept major responsibilities during an emergency as described in the Plan.

5.12 Drills and Exercises

Drills and exercises shall be conducted periodically under simulated conditions for potential credible emergencies. To assure that maximum benefit is derived from emergency tests and exercises, only those persons who may need prior knowledge of the scenario in order to prevent personal injury, property damage, or loss of vital data, shall be notified prior to the test or exercise.

Evaluations of emergency drills and exercises shall be documented, and appropriate changes shall be made to emergency plans and procedures to correct identified deficiencies. A copy of these evaluations shall be forwarded to the BNL Emergency Planning Coordinator. Collider-Accelerator Department copies shall be maintained by the ES&H Coordinator and distributed to appropriate personnel.

5.13 Review

This Plan shall be reviewed annually, and after any incidents, by the ES&H Coordinator, and any other persons that he/she may designate.

6. Documentation

None

7. References

- 7.1 [BNL Emergency Plan.](#)
- 7.2 [C-A OPM 3.1, "Emergency Procedures to be Implemented by the Department Emergency Coordinator".](#)
- 7.3 [C-A OPM 3.2, "Emergency Procedures to be Implemented by the Local Emergency Coordinator".](#)
- 7.4 [C-A-OPM 3.4, "Emergency Procedures to be Implemented by the HP/RCT Technician".](#)
- 7.5 [C-A-OPM 3.5, "Emergency Procedures to be Implemented by the Main Control Room Operators".](#)
- 7.6 BNL Radiation Control (RadCon) Manual.

8. Attachments

- 8.1 [C-A-OPM-ATT 3.0.a "Emergency Call-Down Lists".](#)